He was attacked in 1789 by severe illness, and until his death four years later his life proved a very suffering one. Constant work and insufficient sleep doubtless shortened his days.

His death, sudden and tragic in its circumstances, happened in St. George's Hospital whilst he was demanding from somewhat hostile colleagues what he regarded as a just concession to his pupils.

In the first instance Hunter's work was biological, his range including both the animal and vegetable kingdoms, and the mineral kingdom as well, and to illustrate his investigations he became a collector. But he was chiefly and finally a surgeon, and to the development of surgery he brought all the knowledge and all the training which he had acquired in other branches of science.

He carries us beyond mere handicraft and detail into the region of general principles and law. The surgery of the Middle Ages was a trade, Ambroise Paré and Jean Louis Petit converted it into an art, John Hunter elevated it to the rank of a science.

Hunter's life and work inspired his successors with the spirit of observation, investigation and experiment. We see this exemplified in his great followers, Cline, Abernethy, Astley Cooper, Travers, Green, Brodie, Lawrence, and others since their time. They have been makers of English surgery, and each in turn has done much to raise it to that high standard which it has always maintained.

And now I may refer in detail, yet of necessity very shortly, to some part of Hunter's work in illustration of what I have just said, and show that his views, immensely ahead of his time, fall little short of the principles guiding the most modern surgeon.

I shall first allude to his observations on Animal Heat, which are of the greatest interest, especially when we remember the imperfect quality of the instrumental aid at his disposal; then say some words as to his opinions upon Injuries of the Head, and his never-to-be-forgotten work on Aneurism; I shall briefly review his study of Venereal Diseases; and, lastly, notice his great work on Inflammation and Gunshot Wounds—the last a subject which has always interested me. Nor could the account be in any sense considered complete without a reference to the past and present state of our great museum, itself an imperishable monument to John Hunter's memory.

In 1799, six years after Hunter's death, Parliament purchased his collection and subsequently handed it over in trust to the Royal College of Surgeons for the public advantage. Further grants of money were voted to the College to erect a proper building for preserving and extending "Master" Hunter's collection, and to build a theatre for the delivery of public lectures on anatomy and surgery.

The Hunterian Museum is a monument sufficient alone for the fame of any man. Hunter's aim was no less than to illustrate the whole question of life both in health and in disease. Nature's handiwork in all its manifold perfections is there clearly shown forth by the never-ceasing labour of this great intellect, and he did in the main compass his splendid aspirations.

Hunter rendered to his art and science greater service than any man had done before him, and his claim to our admiration rests not merely on what he did, but on what he suggested might be done.

One cannot but feel amazed at the multitude of the subjects which engaged his interest and attention, the greatness of his achievements, or the far-reaching influence of so many of his inquiries. His spirit survives in the energy of others who follow in his footsteps, and serves to stimulate every student of biological science.

His supreme endeavour was to study life in all its many-sided manifestations. This is the noblest form of study, and the most inexhaustible, yet the problem of life will remain a mystery transcending the power of human investigation or human imagination.

Billroth regarded Hunter as one of the greatest men the English nation has produced, and his work on Inflammation and Gunshot Wounds as the corner-stone of modern English and German surgery. "From Hunter's time to the present day," he says, "English surgery has had about it something noble, and nowhere, either in ancient or modern times, can the pattern be found of a grander scientific career."

Masters of our craft at epochs in surgical history have from time to time declared their art to be then so near perfection that further improvement was impossible.

May we not, nevertheless, hope and expect that surgery will still accomplish new triumphs and yet greater completeness? I am not of those who think there can be any finality in human progress; to believe so would, I consider, render life no longer worth living in its higher sense and greater aspirations. Rather let us consider ourselves as having but just crossed the threshold of the great temple of science, knowing only a small part of that which yet remains to be known.

Anæsthesia has rendered surgical procedures capable of a realisation which not even in dreams could we have supposed possible. It has permitted many new departures in surgery, made many operations feasible which had previously been condemned, and has proved a help of extreme value in the diagnosis of disease. As Oliver Wendell Holmes has said: "The fierce extremity of suffering has been steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony has been smoothed for ever."

Furthermore, one of the scientific descendants of Hunter, deeply imbued with his spirit, transcendently patient and painstaking in detail as was his master, as minute an observer of nature's ways, and as careful an experimenter, after much trying and much thinking, has realised, in the discovery of the methods of antiseptic surgery, a benefit to mankind which only surgeons can to the full appreciate. What was hazardous before is now rendered safe, what was accomplished with pain and suffering is now free from both. There is scarcely a limit to what might be said in praise of this great work. The name of Lister, like that of John Hunter, will stand forth in the records of scientific progress as one who has immeasurably benefited humanity, and as the author of the means whereby surgery has been mainly enabled to make that marvellous progress of which we are all so proud. This is recognised throughout the world, and were I not convinced that our science has fresh achievements in store, I should say that Lister had finally crowned the edifice whose corner-stone Hunter laid.

John Hunter's career has been presented to audiences in this theatre from almost every aspect, and his life and work have been reviewed by the greatest of his successors, some of whom have compelled our admiration by their eloquence and the beauty of the language in which they have expressed their thoughts. I do not expect to equal these, yet I would hope that my story, although "a twice told tale," has aroused in you some measure of sympathetic response. The study of Hunter's works is in itself a liberal education. They show his almost superhuman energy, the versatility of his genius, his extraordinary powers of observation, and beyond all these the absolute mastery of his will over bodily suffering. Of all the great minds which have illuminated the scientific world and guided its destinies, John Hunter's is the one which first directed surgery into the pathways of science, and dying left to surgeons a future in the memory of his past.

He is the one great man without whose aid it is impossible to imagine surgery all that it now is; we cannot take his influence away and yet retain all that we now possess. Our science might have spared some other workers, but it could not have become the science we know without John Hunter.

This great surgeon, one of the greatest men who ever practised surgery, has now long gone to his rest. Cut off in the midst of his glory, he died in harness. Yet, though he be gone, we may well apply to John Hunter what has been said of a pre-eminent statesman lately passed away: "The nation lives that has produced him, may yet produce others like him, and in the meantime it is rich in his memory, rich in his life, and rich above all in his animating and inspiring example."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The 197th meeting of the University Junior Scientific Club was held in the large lecture-room of the museum on Wednesday, February 15, the President in the chair. There were present ninety members and twenty visitors. Prof. Odling delivered a lecture on chemical views in controversy about the year 1850. The following is an abstract of the lecture: To put back the clock is always a very difficult task, and to understand exactly the views of chemists of fifty years ago is extremely hard, as one must forget for the time being all that has been discovered since. In chemistry, as in most other

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sciences, the tendency is to look forward and not backward; but it must not be forgotten that the future will be but a development of the present, as the present has been a development of the past. The evolution of chemistry has taken place along one continuous line, broken here and there by great fundamental discoveries, which have been rather apt at first to warp the line of development, and to make it a little one-sided. Thus the striking aptness of Dalton's atomic theory to explain the laws of chemical combination, which he had formulated, and the tables of proportional numbers deduced from them, attracted the attention of chemists to the determination of atomic weights. The importance of molecular weights, or as Prof. Odling preferred to call them unit weights, of compounds was not fully recognised till some half-century later, although Avogadro had pointed the way in his hypothesis put forward in 1811. In the forties Laurent and Gerhardt began to investigate unit weights, and laid the foundation of our present system. In this country Williamson and Brodie were the chief workers at the subject, and Prof. Odling described himself as their junior colleague to whose share much of the fighting fell. They had before them the problem of determining correct atomic weights for the elements, a problem which could only be solved after correct determinations of the unit weights of their compounds; and they considered that physical evidence as to unit weights must be confirmed by the chemical behaviour of substances. Hence the importance of Williamson's theory of etherification; for by showing that ether was not merely the oxide of a hydrocarbon radical, but that it was a combination of two hydrocarbon radicals with oxygen, he was able to deduce the unit weights of alcohol, ether, and other compounds compared with that of water, and to show that the carbon always combines in multiples of twelve, and oxygen in multiples of sixteen, and so these numbers must represent the real atomic weights. It was some years, however, before these new atomic weights, based on a true conception of unit weights, were generally accepted. The first text-book in which sixteen was used throughout as the atomic weight of oxygen being Prof. Odling's "Manual of Chemistry," published in 1861. Subsequently Newlands, from the revised atomic weights, suggested the periodic system of the elements, which was developed by Prof. Odling and Lothar Meyer, and completed by Mendeléeff. The chief work of chemists during the last quarter of a century might be briefly described as the investigation of the internal structure of the chemical molecule, and this, being dependent on an accurate knowledge of unit and atomic weights, is but the natural development of the most important work of the fifties—the correct determination of unit weights.

Mr. A. E. H. Love, F.R.S., Fellow of St. John's College, Cambridge, and University Lecturer in Mathematics, has been elected Sedleian Professor of Natural Philosophy in succession to the late Prof. Bartholomew Price.

CAMBRIDGE.—A Frank Smart Studentship in Botany, value 100*l.* a year for two or three years, will be vacant in June. Candidates must be B.A.s who have taken honours in Natural Science, and are of less than fourteen terms' standing. Names are to be sent to the Master of Gonville and Caius College by June 10.

Mr. A. W. Hill, of King's College, has been appointed Demonstrator of Botany.

Graces for the acceptance of the benefactions offered towards the establishment of a department of Agriculture will be submitted to the Senate on March 2.

A Salomons Scholarship of 70*l.* a year for three years will be vacant in 1900 at Caius College. Candidates will be examined in November 1899; they must be under nineteen, and must declare their intention of entering the engineering profession.

THE first of a series of occasional lectures at Bedford College will be given by Dr. W. J. Russell, F.R.S., on "How pictures can be taken on a photographic plate in the dark," to-morrow, February 24.

IN response to Mr. Balfour's recent appeal for the endowment of medical education and research, Sir Frederick Wills has forwarded to the treasurer of Guy's Hospital a donation of 5000*l.* to be used for the benefit of the medical school.

IT is remarked in *Science* that Harvard University some time ago established a class somewhat similar to the docents of the German University, though the lectureships are limited to a period not exceeding four months, and the University does not even collect such fees as may be charged. The first lectures under this system are now announced.

THE Glasgow University General Council have decided that the memorial to Principal Caird shall take the form of a window on the east side of the Bute Hall. The total cost is estimated at 900*l.*, of which 834*l.* have been subscribed. Mr. Archibald Craig, 156 St. Vincent Street, Glasgow, will be glad to receive contributions to make up the sum required to complete the memorial.

THE trustees of the Reid Trust for the education of women have decided to offer a scholarship at the London School of Medicine for Women, in memory of their co-trustee, the late Miss Bostock, of Penmaen, Glamorganshire. The value of the scholarship will be 60*l.* a year, tenable for two or four years, and awarded on the result of the preliminary scientific examination of the University of London. The Bostock scholar must read for the London medical degree. Further particulars may be obtained from the hon. secretary of the Reid Trust, Bedford College, York-place, W.

IN the House of Lords on Monday, Lord Norton asked the Lord President of the Council when the Education Bill would be introduced. In reply the Duke of Devonshire said that there appeared to be some misapprehension as to the character of his Bill. The Bills which he introduced last year were for the creation of a Board of Education and for the registration of teachers. Neither of those Bills could be described as an Education Bill. The measure which he should introduce would not, as far as he was aware, go beyond the scope of the Bill which he introduced last year. He hoped that next week or the following week he might be able to present the Bill again, and be able perhaps to name the day when the second reading would be taken.

THE sub-committee on Commercial Education, appointed by the London County Council in May 1897, have presented their report to the Technical Education Board. The committee have considered in detail the improvements desirable in elementary and secondary schools for pupils who propose to enter on a commercial career. Among the recommendations are the following:—

(1) That it is desirable that there should be in many of the public secondary day schools in London of the second grade departments devoting themselves primarily and avowedly to the preparation for commercial life of boys who will leave school at sixteen; that in such departments, while a good general education should be given, special attention should be devoted to modern languages in such a way as to turn out pupils able to speak and correspond fluently in at least two modern languages, to the teaching of arithmetic so as to secure perfect facility in the use of the metric system, and to ensuring a good general acquaintance with the commercial geography of foreign countries

(2) That it is desirable that there should be provided in London in at least one public secondary day school of the first grade a department devoting itself primarily and avowedly to the preparation for business life of boys leaving school at eighteen or nineteen; that the curriculum of such department should not lead up to a classical or mathematical career at the Universities, but should qualify its pupils either to enter the higher ranks of commercial life, or to pursue an advanced course of study in the economic and commercial faculty of the new London University, or in other institutions of higher commercial education.

(3) That it is desirable that full and express recognition should be given to higher commercial education in the reorganisation of London University, and that it be referred to the special sub-committee of the Board, dealing with the University, to consider whether it would not be wise to urge upon the Commissioners the establishment, from the first, of a separate faculty of economic and commercial science, the provision of endowed professorships in the various subjects of higher commercial education, and such arrangements as will facilitate and encourage those designed for or engaged in the higher ranks of business to take advantage of University teaching.

SCIENTIFIC SERIALS.

Bulletin of the American Mathematical Society (January).—Report on the theory of projective invariants: the chief contributions of a decade (by Prof. H. S. White), was read before Section A of the American Association for the Advancement of Science in August 1898. The starting-point is from th

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